



MONASH University
Information Technology

FIT5037
Network security

Unit Guide

Semester 2, 2015

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FIT5037 Network security - Semester 2, 2015

Network security is an important part of any computer network and essential knowledge for IT professionals. This unit provides fundamental network security for IT students and professionals. It covers wired and wireless communication and network security, security at different layers, computer system security, network services and applications security, basic defence systems, cryptography for network security, techniques for identifying system vulnerabilities and penetration testing.

Mode of Delivery

Caulfield (Evening)

Workload Requirements

Minimum total expected workload equals 12 hours per week comprising:

(a.) Contact hours for on-campus students:

- Two hours of lectures
- One 2-hour laboratory/tutorial

(b.) Additional requirements (all students):

- A minimum of 8 hours independent study per week for completing lab and project work, private study and revision.

See also Unit timetable information

Additional workload requirements

Please be advised that FIT5037 is a heavy unit and you will need to consistently study the unit materials each week. There will be a large amount of work to be done during the semester from Week 1 onwards.

Unit Relationships

Prohibitions

FIT5044

Prerequisites

((FIT9131 or FIT5131 or FIT9017) and (FIT5163)) or equivalent

Students are expected to have knowledge and experience with computer networking, Unix operating system, basic maths for cryptography and socket programming.

Chief Examiner

Dr Phu Le

Campus Lecturer

Caulfield

Dr Phu Dung Le

Consultation hours: TBA

Tutors

Caulfield

Guy Kijthaweesinpoon

Consultation hours: TBA

Your feedback to Us

Monash is committed to excellence in education and regularly seeks feedback from students, employers and staff. One of the key formal ways students have to provide feedback is through the Student Evaluation of Teaching and Units (SETU) survey. The University's student evaluation policy requires that every unit is evaluated each year. Students are strongly encouraged to complete the surveys. The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

For more information on Monash's educational strategy, see:

www.monash.edu.au/about/monash-directions/ and on student evaluations, see:
www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html

Previous Student Evaluations of this Unit

This unit has been redeveloped substantially from previous semesters.

If you wish to view how previous students rated this unit, please go to
<https://emuapps.monash.edu.au/unitevaluations/index.jsp>

Academic Overview

Learning Outcomes

At the successful completion of this unit, students should be able to:

- explain the fundamentals of wired and wireless network security;
- use practical skills to identify computer system vulnerabilities and carry out penetration testing;
- identify important network security components, then design and implement defence systems.

Unit Schedule

Week	Activities	Assessment
0		No formal assessment or activities are undertaken in week 0
1	Introduction to wired and wireless communications and networks and security	
2	Introduction to cryptography for communications and networks security	Weekly tutorials/Lab Exercises (Week 2 to Week 10) commence
3	Security at network layer	
4	Security at transport layer	
5	Security at application layer	
6	Security at application layer (continued)	
7	Computer system security and basic defense system	
8	Computer system security and basic defense system (continued)	
9	Computer system vulnerabilities and penetration testing	Assignment 1 due Week 9, Friday 4pm
10	Computer system vulnerabilities and penetration testing (continued)	
11	Research in network security	
12	Theoretical Test (in lecture)	Theoretical Test in Week 12 lecture
	SWOT VAC	No formal assessment is undertaken in SWOT VAC. Assignment 2 due Week 14, Monday 4pm. Presentation in Week 14
	Examination period	LINK to Assessment Policy: http://policy.monash.edu.au/policy-bank/academic/education/assessment/assessment-in-coursework-policy.html

*Unit Schedule details will be maintained and communicated to you via your learning system.

Teaching Approach

Lecture and tutorials or problem classes

This teaching and learning approach provides facilitated learning, practical exploration and peer learning.

Assessment Summary

In-semester assessment: 100%

Assessment Task	Value	Due Date
Assignment 1 (Group Assignment)	30%	Week 9, Friday 4pm (submit your assignment using the assignment box on level 6 of H building)

Unit Schedule

Assignment 2 (Group Assignment)	30%	Week 14, Monday 4pm (submit your assignment using the assignment box on level 6 of H building). Presentation in Week 14
Lab Exercises	10%	Weekly (Week 2 to Week 10) - no submission required
Theoretical Test	30%	Week 12 lecture

Assessment Requirements

Assessment Policy

Faculty Policy - Unit Assessment Hurdles

(<http://intranet.monash.edu.au/infotech/resources/staff/edgov/policies/assessment-examinations/assessment-hurdles>)

Academic Integrity - Please see resources and tutorials at

<http://www.monash.edu/library/skills/resources/tutorials/academic-integrity/>

Assessment Tasks

Participation

- **Assessment task 1**

Title:

Assignment 1 (Group Assignment)

Description:

Propose and implement a network security solution for your network

- ◆ You are required to set up your own network and propose a basic defense system as a security solution to protect your network. Your solution will have to include cryptography, Kerberos authentication system, firewalls, intrusion detection systems, Radius, and Tripwire.

Refer to the assignment spec for more details.

Weighting:

30%

Criteria for assessment:

You need to be able to understand the theory and demonstrate your practical work to your tutor.

- ◆ If you fail to understand what you have done you will get Zero for the assignment.
- ◆ If you can demonstrate your practical work but do not completely understand the theory, you will get a Pass at the maximum.
- ◆ If you can demonstrate your practical work but understand 25% of the theory, you will get a Credit as the maximum.
- ◆ If you can demonstrate your practical work and understand 50% of the theory, you will get a Distinction as the maximum.
- ◆ If you can demonstrate your practical work and understand the theory well, you will get a High Distinction.

It is a group assignment. Students will receive equal marks. However, every member of the group will be interviewed about their individual contributions.

Due date:

Week 9, Friday 4pm (submit your assignment using the assignment box on level 6 of H building)

• **Assessment task 2**

Title:

Assignment 2 (Group Assignment)

Description:

System vulnerability and penetration testing

Part I (system vulnerabilities)

- ◆ Identify system vulnerabilities in your wired and wireless networks using your research knowledge (without tools), logically explain how you identify your system vulnerabilities, demonstrate your attacking techniques, and propose solutions to mitigate the attacks.

Part II (penetration testing)

- ◆ Do penetration testing to your system using free available tools (such as Nessus, Wirehark, and Metasploit) to find serious vulnerabilities, logically explain how you identify your system vulnerabilities, demonstrate your attacking techniques, and propose solutions to mitigate the attacks.
- ◆ Propose solutions and changes to your system.

Refer to the assignment spec for more details.

Weighting:

30%

Criteria for assessment:

You need to be able to understand the theory and demonstrate your practical work to your tutor.

- ◆ If you fail to understand what you have done you will get Zero for the assignment.
- ◆ If you can demonstrate your practical work but do not completely understand the theory, you will get a Pass at the maximum.
- ◆ If you can demonstrate your practical work but understand 25% of the theory, you will get a Credit as the maximum.
- ◆ If you can demonstrate your practical work and understand 50% of the theory, you will get a Distinction as the maximum.
- ◆ If you can demonstrate your practical work and understand the theory well, you will get a High Distinction.

For group work students will receive equal marks. However, every member of the group will be interviewed about their individual contributions.

You will have to submit a report and give a presentation.

Due date:

Week 14, Monday 4pm (submit your assignment using the assignment box on level 6 of H building). Presentation in Week 14

• **Assessment task 3**

Title:

Lab Exercises

Description:

Lab Exercises will be handed out each week from Week 2 to Week 10. Please read the handouts for detail.

Assessment Requirements

Weighting:

10%

Criteria for assessment:

You will get full marks if you can complete all the exercises and demonstrate them well. Different marks will be given depending on the level of completion and demonstration.

No submission is required.

Due date:

Weekly (Week 2 to Week 10) - no submission required

• Assessment task 4**Title:**

Theoretical Test

Description:

The theoretical test will evaluate your understanding of the theories covered in the unit. It is an open book test and 80% are multiple choice questions and 20% are short answer questions. You will have to study all the materials delivered in the lectures and tutorials/labs.

Weighting:

30%

Criteria for assessment:

Correct answers to questions, demonstrating understanding of the materials learned.

Due date:

Week 12 lecture

Learning resources

Monash Library Unit Reading List (if applicable to the unit)

<http://readinglists.lib.monash.edu/index.html>

Feedback to you

Types of feedback you can expect to receive in this unit are:

- Graded assignments with comments
- Interviews

Extensions and penalties

Submission must be made by the due date otherwise penalties will be enforced.

You must negotiate any extensions formally with your campus unit leader via the in-semester special consideration process: <http://www.monash.edu.au/exams/special-consideration.html>

Returning assignments

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later.

Assignment submission

It is a University requirement

(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-academic-integrity-managing-pla>

for students to submit an assignment coversheet for each assessment item. Faculty Assignment coversheets can be found at <http://www.infotech.monash.edu.au/resources/student/forms/>. Please check with your Lecturer on the submission method for your assignment coversheet (e.g. attach a file to the online assignment submission, hand-in a hard copy, or use an electronic submission). Please note that it is your responsibility to retain copies of your assessments.

Online submission

If Electronic Submission has been approved for your unit, please submit your work via the learning system for this unit, which you can access via links in the my.monash portal.

Recommended Resources

Students with their own laptop (recommended minimum 8GB RAM) can, for working on assignments:

- install Unix system and virtual machines
- install, configure and test software packages: VM ware, Linux OS (Fedora or Ubuntu or other version of Linux), ssh, sendmail, http, and more (TBA)
- set up simple networks with network and security components

All listed software are open source (free) and available online. Students will not have to pay for any software. Students who do not have access to a laptop can work on the computers in the designated labs.

Check Moodle for any announcements and updates.

Other Information

Policies

Monash has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards, and to provide advice on how they might uphold them. You can find Monash's Education Policies at:

www.policy.monash.edu.au/policy-bank/academic/education/index.html

Faculty resources and policies

Important student resources including Faculty policies are located at

<http://intranet.monash.edu.au/infotech/resources/students/>

Graduate Attributes Policy

<http://www.policy.monash.edu/policy-bank/academic/education/management/monash-graduate-attributes-policy.h>

Student Charter

www.opq.monash.edu.au/ep/student-charter/monash-university-student-charter.html

Student services

The University provides many different kinds of support services for you. Contact your tutor if you need advice and see the range of services available at <http://www.monash.edu.au/students>. For Malaysia see <http://www.monash.edu.my/Student-services>, and for South Africa see <http://www.monash.ac.za/current/>.

Monash University Library

The Monash University Library provides a range of services, resources and programs that enable you to save time and be more effective in your learning and research. Go to www.lib.monash.edu.au or the library tab in [my.monash](#) portal for more information. At Malaysia, visit the Library and Learning Commons at <http://www.lib.monash.edu.my/>. At South Africa visit <http://www.lib.monash.ac.za/>.

Disability Liaison Unit

Students who have a disability or medical condition are welcome to contact the Disability Liaison Unit to discuss academic support services. Disability Liaison Officers (DLOs) visit all Victorian campuses on a regular basis.

- Website: <http://www.monash.edu/equity-diversity/disability/index.html>
- Telephone: 03 9905 5704 to book an appointment with a DLO; or contact the Student Advisor, Student Community Services at 03 55146018 at Malaysia
- Email: dlu@monash.edu
- Drop In: Equity and Diversity Centre, Level 1, Building 55, Clayton Campus, or Student Community Services Department, Level 2, Building 2, Monash University, Malaysia Campus